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| EXAMINER | |
|---|---|
| TURK, NEIL N | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/524,615 | MONTAGU ET AL. | |
| | Examiner | Art Unit | |
| | NEIL TURK | 1797 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *19 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,3,6,8,11,21,22,24,26,39,41,45 and 51-56* is/are pending in the application.

4a) Of the above claim(s) *39, 41, 45, and 53-56* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,6,8,11,21,22,24,26,51 and 52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Remarks*

This Office Action fully acknowledges Applicant's remarks filed on December 19th, 2008. Claims 1, 3, 6, 8, 11, 21, 22, 24, 26, 39, 41, 45, and 51-56 are pending. Claims 2, 4, 5, 7, 9, 10, 12-20, 23, 25, 27-38, 40, 42-44, and 46-50 have been cancelled. Claims 39, 41, and 53-56 are withdrawn from consideration. Any objection/rejection not repeated herein has been withdrawn by The Office.

### *Election/Restrictions*

In view of Applicant's amendments to claims 39 and 45 to include the array reader of claim 1, the lack of unity requirement between the groups of claims remains.

The inventions listed as Groups I-III (and including Group IV, newly added, as outlined below) do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The special technical feature shared by Groups I-III (and including Group IV, newly added, as outlined below) of the array reader of claim 1 is not a special technical feature as it does not make a contribution over the prior art. This is seen by the disclosure of Rava et al. (5,545,531) in view of Trulson (5,578,832), with the obvious modification of a laser light source to an LED light source supplied by Trulson.

Thereby, Group II (cls. 39, 41) and Group III (cl. 45) have been withdrawn from consideration.

**Newly submitted claims 53-56** are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 53-56 constitute a new group, Group IV, and the inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The special technical feature shared by Groups I-IV of the array reader of claim 1 is not a special technical feature as it does not make a contribution over the prior art. This is seen by the disclosure of Rava et al. (5,545,531) in view of Trulson (5,578,832), with the obvious modification of a laser light source to an LED light source supplied by Trulson.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 53-56 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

**Claims 1, 3, 6, 8, 11, 21, 22, 24, 26, 51, and 52** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The amended recitation of claim 1 to, "the reader has no mechanism for moving the array relative to said systems during reading of the array" constitutes new matter in the claims. Applicant's disclosure in paragraph [0062, 0063] and figure 1 (of pre-grant publication US 2006/0127946) discloses a positioner 105 for positioning of the substrate, which carries the array, relative to the systems of the reader. Examiner asserts that this shows a mechanism for moving the array relative to said systems during reading of the array. While Applicant's disclosure points to capabilities of using/applying the reader in such a fashion, this does not provide basis for such a negative limitation to be applied as it relates to the apparatus of the invention.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 1, 8, 21, 24, 26, and 51** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rava et al. (5,545,531), hereafter Rava, in view of Trulson et al. (5,578,832), hereafter Trulson.

Rava discloses a device for concurrently processing multiple biological chip assays. Rava discloses a biological chip plate reader 100 (illumination system for flooding the array between 20 to 50 degrees), biochip plate 120, and a computer 130 (column 4, figs. 1,2). Rava shows in figure 2 an excitation source 210 (a laser) for exciting the markers of the array (fluorescently labeled, CY3 or CY5 dyes, for example), and a CCD array and collection optics 240 (Examiner asserts a CCD array and collection optics include a numerical aperture in a lens in order to provide such imaging) for detecting and generating signals, which are utilized to form a representative image (image-acquiring axis is substantially normal to the substrate carrying the array), and further discloses a digital computer 270 for managing data collection (columns 5-8, fig. 2). Rava also discloses that galvometric scanners or rotating polyhedral mirrors may be employed to scan the excitation light across the sample; as a result, a 2-dimensional image of the sample is obtained (here, a 2-dimensional image of the entire array in a single frame is captured and the reader has no moving mechanism for moving the array relative to the systems during reading of the array) (lines 47-56, col. 6). Rava further discloses that the body of the biological chip and the substrate may be made transparent to the wavelengths of light being used and the biological chips may also be made to be light-absorbing, as it may be made from functionalized glass and surfaces of the substrate may be composed of different materials as the substrate, such as light-

absorbing glass materials (columns 8&9, figs. 3&4). Rava further discloses that for fluorescein, sufficient signal-to-noise to read a chip image with a CCD detector can be obtained in about 30 seconds using a 3 $mW/cm^2$ and 488 nm excitation, and by increasing the laser power and using dyes such as CY3 or CY5, each well can be read in less than 5 seconds (lines 57-67, col. 6, figures 1-8). With regard to claim 51, Rava discloses that the choice of CCD array will depend on the number of probes in each biological array (lines 25-33, col. 6).

Rava does not specifically disclose that the illumination system comprises at least one light-emitting diode. Rava also does not disclose that the illumination system includes a homogenizer. Rava does not disclose that the image collection and recording system has a field of view on the substrate of area between about 50 $mm^2$ and 300 $mm^2$

Trulson discloses an apparatus for detecting a labeled marker on a sample located on a support, in which excitation radiation is utilized to excite an emission from the labeled material (abstract). Trulson discloses that the excitation radiation source may be, for example, light-emitting diodes (lines 11-21, col. 6, figures). Trulson further discloses that in some cases the light produced by the array of LEDs may be nonhomogoneous, and light-shaping diffusers or fiber bundles are used to homogenize the excitation light.

It would have been obvious to modify Rava to include LEDs as excitations sources and a homogenizer such as taught by Trulson in order to provide a known, and cheaper alternative form of an excitation source for use in exciting labeled probes or

targets and a homogenizer for the purpose of avoiding producing non-homogenous excitation radiation from an array of LEDs so that the hybridization assay may be carried out more effectively and accurately.

Further, Rava discloses that the choice of CCD array will depend on the number of probes in each biological array (lines 25-51). Thereby, it would have been obvious to choose a CCD array resulting in a field of view on the substrate of area between about 50 $mm^2$ and 300 $mm^2$ so as to appropriately correspond with the particular number of probes in each biological array.

**Claims 3 and 52** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rava in view Trulson as applied to claims 1, 8, 21, 24, and 26 above and in further view of Mirzabekov et al. (5,851,772), hereafter Mirzabekov.

Rava/Trulson does not disclose that the image collection and recording system has an effective aperture between NA = 0.3 and NA = 0.6, or between NA = 0.4 and NA= 0.55.

Mirzabekov discloses a microchip method for enrichment of specific DNA sequences (abstract). Mirzabekov discloses a multi-wavelength fluorescence microscope coupled with a CCD-camera for image analysis. Mirzabekov discloses an objective yielding a 3mm observation field enabled analysis of over 1,000 elements of the microchip at once and a numerical aperture of 0.4 allowed the illumination of the object field up to 7mm in diameter and projected 2.7x2.7mm of the microchip on the

CCD matrix, and the same aperture allows for analyzing 5x5 microchip areas (lines 40-67, col. 10).

It would have been obvious to modify Rava/Trulson to include a numerical aperture of 0.4 such as taught by Mirzabekov in order to provide a numerical aperture known to be useful for imaging a wide area of elements on a microchip with fluorescently-labeled probes.

**Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rava in view of Trulson as applied to claims 1, 8, 21, 24, and 26 above.

Rava/Trulson does not disclose an illumination to the array on the substrate of a power density greater than 30 $mW/cm^2$.

It would have been obvious to modify Rava/Trulson to provide excitation illumination to the array on the substrate having a power density greater than 30 $mW/cm^2$ so as to allow for reading each well faster and thereby saving time in performing readings.

**Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rava in view of Trulson as applied to claims 1, 8, 21, 24, and 26 above.

Rava/Trulson does not specifically disclose that the array reader is constructed and arranged to deliver an image of the field of view reduced between about 30% and 50%.

Trulson discloses that resolution of the image may be manipulated by increasing or decreasing the magnification of the collection optics (col. 27).

It would have been obvious through routine experimentation to modify Rava/Trulson to deliver to the solid state sensor array an image of the field of view reduced between about 30% and 50% so as to provide optimal resolution of the image.

**Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rava in view of Trulson as applied to claims 1, 8, 21, 24, and 26 above and in further view of Walton et al. (6,294,327), hereafter Walton.

Rava/Trulson does not specifically disclose two different light sources at different axes to the substrate.

Walton discloses an apparatus for detecting labeled samples (abstract; columns 3&4). Walton discloses that two light sources are used, one serving as a reflection mode light source and one serving as a diffuse scattering light source (illumination at 45 degrees in diffuse mode and at 20 degrees in reflection mode) (lines 55-67, col. 6, fig. 6). Walton also discloses that the light sources may be LEDs (lines 50-54, col. 5). Walton further discloses that a single linear CCD array, or multiple linear or area CCD arrays can be used to convert the scattered light image into an electrical signal which is converted to a voltage and then digitized by an A/D converter, in which the digital signal is stored in a computer as an image (lines 12-21, col. 7).

It would have been obvious to modify Rava/Trulson to include two different light sources at different axes to the substrate such as taught by Trulson in order to provide an illumination system that would provide a more dynamic range of imaging of the array.

***Response to Arguments***

Applicant's arguments filed December 19th, 2008 have been fully considered but they are not persuasive.

**With regard to claim 1** rejected under 35 USC 103(a) over Rava in view of Trulson, Applicant traverses the rejection. Applicant argues that each of the references requires scanning to assemble an image of the entire array and this requires a costly mechanism for moving the array relative to the recording system. Examiner argues that, as discussed above, Rava discloses that alternatively to the multi-axis translation stage, galvometric scanners or rotating polyhedral mirrors may be employed to scan the excitation light across the sample, and as a result, a 2-dimensional image of the sample is obtained (see lines 47-51, col. 6).

Applicant further argues that neither teaches a diode lighting system that floods entirely the array with excitation radiation. Examiner argues that modification of Rava by Trulson provides a known alternative excitation source (to the laser, for example, in Rava) in the form of an LED which can likewise apply excitation energy for use in exciting labeled probes or targets. Further, with regard to the limitation "...arranged to flood entirely..." Examine asserts that such a limitation is functional and met by the combination of Rava in view of Trulson. Rava in view of Trulson discloses all of the

claimed structural elements and relationships of the illumination system, namely, that the system comprises a light source in the form of at least one light-emitting diode and the illumination system provides an illumination path disposed at an angle between about $20^{o}$ and $50^{o}$ to the planar extent of the substrate, see figs. 1&2 of Rava. Thereby, as Rava/Trulson disclose the positively recited structural elements and relationships of the illumination system, such an illumination system is said to flood entirely the two-dimensional array as claimed.

Applicant further argues that neither teaches creating an image on the sensor array of the same order of magnitude as the size of the array of photo responsive features to enable imaging in a single frame. Likewise, as discussed above, Rava/Trulson discloses all of the claimed elements and structural relationships of the image collection and recording system, as claimed. Rava/Trulson disclose an image collection and recording system having a field of view for emissions form the features, and also having an image-acquiring axis substantially normal to the planar extent of the substrate, and employing a two-dimensional sensor comprising a solid-state array of photosensitive elements, and such collection and recording system has an intermediate numerical aperture. Thereby, Rava/Trulson discloses an image collection and recording system that is constructed and arranged, as claimed, to provide the claimed functionalities, which include applying in a single frame the entire array of features in a size (up to 25% magnification and reduction down to 75%; which range includes no change in size) of the same order of magnitude as the size of the array of features.

Applicant further argues that neither teaches the use of the numerical aperture employed. Examiner argues that such an argument is not commensurate in scope with the claims. Claim 1 does not require a specific numerical aperture and only recites that the image collection and recording system has an intermediate numerical aperture. Examiner argues that the CCD array and collection optics of Rava includes a numerical aperture in a lens in order to provide the imaging.

**With regard to claim 8** rejected under 35 USC 103(a) over Rava in view of Trulson, Applicant traverses the rejection. Applicant argues that Rava and Trulson do not disclose a field of view of the array reader has a diameter of 10 mm or more. Applicant argues that Rava and Trulson are concerned with confocal imaging in which a spot of only 2 microns is illuminated. Applicant's argument is pointed at a single instance dealing with focusing of a beam, and not the field of view of the array reader. Examiner argues that Rava is dealing with scanning of a standard 12x8 96 well plate in which the field of view of the reader would be 10mm or greater.

**With regard to claim 21** rejected under 35 USC 103(a) over Rava in view of Trulson, Applicant traverses the rejection. Applicant argues that Rava in view of Trulson does not disclose a substrate carrying excitation energy reference features distributed across the two-dimensional array of features. Examiner asserts that Rava discloses employing fluorescent probes distributed across the two-dimensional array of features, and such fluorescent probes act as excitation energy reference features in that

when a binding does not occur at a particular probe the fluorescent reaction will exhibit a different excitation energy (compared to where binding does occur for the target) so as to act as a reference against those probes in which a binding did occur.

**With regard to claim 24** rejected under 35 USC 103(a) over Rava in view of Trulson, Applicant traverses the rejection. Applicant argues that Rava shows no diode illumination, and the fact that Rava discloses the well known dyes of Cy3 and Cy5 does not make the claimed combination obvious. Examiner argues that the limitations of claim 24 are drawn to the light sources with capabilities of exciting the dyes, and not to the dyes themselves being recited as elements of the system. Examiner asserts that Trulson remedies the deficiency of Rava not showing diode illuminations. The combination of Rava/Trulson is thereby an obvious combination above, and further, as Rava discloses using such dyes in the assay, it is seen that the diodes would obviously be selected to excite Cy3 and Cy5 so as to read the wells faster.

**With regard to claim 26** rejected under 35 USC 103(a) over Rava in view of Trulson, Applicant traverses the rejection. Applicant argue that while homogenizers are known to be used with diodes, such an admission does not detract from the novelty and patentability of the combination of claims 1 and 26. Applicant argues that Trulson is related to homogenizing in a linear context, whereas the claims relate to a homogenizer reducing variation in flux density across the entire two dimensional field of illuminated area that is imaged in one frame on the sensor array. Examiner argues that Trulson is

not being relied upon for 2-dimensional reading. As discussed above with respect to claim 1, Rava does disclose an array reader in which the image collection and recording system is constructed an arranged as claimed, such that it applies in a single frame a 2d image of the array. Thereby, combination of Rava with Trulson with respect to claim 26 is seen as obvious for the reasons set forth above.

**With regard to claim 3** rejected under 35 USC 103(a) over Rava in view of Trulson and in further view of Mirzabekov, Applicant traverses the rejection.

Applicant argues that Mirzabekov obviously requires movement of the chip relative to the microscope. Examiner argues that Mirzabekov is not being relied upon for its teaching of a lack of moving mechanism for the array relative to the systems. As discussed above, Rava discloses a reader in which no moving mechanism is involveed for moving the array relative to the systems during operation.

Applicant further argues that Mirzabekov has no suggestion to use virtually no magnification. Examiner argues that Mirzabekov is not being relied upon for such a teaching, and, as discussed above, Rava discloses such limitations of claim 1.

Applicant also argues that Mirzabekov employs a mercury lamp to illuminate the field, having no suggestion of a diode lighting system. Examiner argues that Mirzabekov is not being relied upon for teaching a diode lighting system, and Trulson cures such a deficiency, as discussed above. Further, Applicant argues that the mere suggestion of Mirzabekov of a numerical aperture of a value also employed according to the current invention, taken with the other references relied on by the Examiner, fails to

suggest the novel combination of the claims, or the results achieved. Examiner argues that the mere suggestion of Mirzabekov is not what is being relied upon. As discussed above, Mirzabekov discloses an imaging system in which a likewise CCD-camera is utilized for imaging analysis, in which a numerical aperture of 0.4 allows for imaging a wide area of elements on a microchip. Examiner further asserts that in view of Applicant's amendments to the claims, **claim 52** is now also rejected under this combination.

**With regard to claim 6** rejected over Rava in view of Trulson, Applicant traverses the rejection. Applicant argues that neither Rava, nor Trulson (the rejection does not involve Mirzabekov as listed in Applicant's arguments) teach a diode illumination of an entire two-dimensional array and do not do such illumination at the claimed power intensity. Examiner argues that, as discussed above, the combination of Rava in view of Trulson provides a diode illumination of an entire two-dimensional array. Further, Rava teaches that increasing power of the light source allows one to read each well faster. Thereby, the additional modification to provide the power density at greater than 30 $mW/cm^2$ is an obvious modification so as to allow for reading each well faster and thereby saving time in performing readings. Examiner asserts that absent a showing of criticality or unexpected results arising otherwise, such a modification will be seen as obvious for the reasons discussed above.

**With regard to claim 11** rejected over Rava in view of Trulson, Applicant traverses the rejection. Applicant argues that Rava in view of Trulson does not provide direction to one of ordinary skill in the art to adopt the claimed combination of reduction of the image between 30% and 50%. Examine asserts that the modification is seen as obvious for optimizing the resolution of the image, as discussed above. Examiner asserts that absent a showing of criticality or unexpected results arising otherwise, such a modification will be seen as obvious for the reasons discussed above.

**With regard to claim 22** rejected over Rava in view of Trulson and in further view of Walton, Applicant traverses the rejection.

Applicant argues that Walton is directed to a scanner instrument, and while Walton discloses more than one light source, it is not for the purpose of exciting fluorophores or the like, and not for imaging emission over an entire two-dimensional array in a single frame. Examiner argues that, as discussed above, Rava in view of Trulson provide for illuminating and imaging over an entire two-dimensional array in a single frame and Walton has been provided for a teaching of two light sources being used to detect labelled samples, analogous to that of Rava/Trulson. Examiner asserts that the combination of Rava in view of Trulson and in further view of Walton provides an obvious modification for the inclusion of two light sources at different axes to the substrate so as to provide an illumination system that would provide a more dynamic range of imaging of the array.

**With regard to newly added claim 51**, Applicant argues that the field of view on the substrate of an area between 50 $mm^2$ and 300 $mm^2$ is much larger than that disclosed by Mirzabekov. Examiner argues that Applicant's arguments are moot in view of the new grounds of rejection applied above, as claim 51 has been rejected over Rava in view of Trulson.

**The other references-**

Applicant argues that the other references (Mills, Giaever, and Vo-Dinh) relate to chip features, not readers, and do not make up for the deficiencies of the principle references discussed above. Here, Applicant has not pointed out the supposed errors with "the other references" with respect to the claimed subject matter. Further, Examiner asserts that the claims for to which such references were applied have been cancelled, and thereby Applicant's arguments are moot. Examiner further asserts that the principle references do not have the purported deficiencies as discussed above.

**With regards to claims 39, 41, and 45** the claims are maintained withdrawn from consideration, as the claims lack unity as discussed above.

**With regards to newly added claims 53-56**, these claims are restricted by original presentation, as discussed above. Examiner further notes that new claim 53 presents a change of scope of the invention as it would relate to previously presented, now cancelled claim 14. Claim 53 now recites a specific relative structural limitation of

the carrier being beneath the substrate, and further now specifically requires a material of construction for the carrier to be opaque, which provides significant differences between previously presented, now cancelled claim 14. Furthermore, by this, a search for the one combination (previously presented, now cancelled claim 14) will not necessarily yield results relevant to the new combination of claim 53. Since Applicant has received a FAOM for previously presented, now cancelled claim 14, the new combination to claims 53-56 is withdrawn as being drawn to a non-elected invention.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NEIL TURK whose telephone number is (571)272-8914. The examiner can normally be reached on M-F, 9-630.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NT

/Jill Warden/
Supervisory Patent Examiner, Art Unit 1797